AEROSPACE

SAFETY

UNITED STATES AIR FORCE

JANUARY 1965

ZERO-ZERO

SEE THE SPECIAL REPORT ON PAGE FOURTEEN

AEROSPACE SAFETY

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AFRP 62-1 JANUARY 1965 VOLUME 21 NUMBER 1

FALLOUT

FOR WANT OF A WARNING

"For Want of a Warning" (October) parallels an F-100 accident of two years ago. At that time the use of runway abort signals was proposed through the Air Force Suggestion Program and disapproved. The idea was not original and two types have been seen. In 1957, Duluth installed an "Abort Light" a thousand feet down the scramble runway. It was turned on to stop a scramble. Around 1959, another base, perhaps McClellan, had remote operated flares 5000 feet down the runway. They were fired when any aircraft had an observed malfunction during takeoff.

Kick the idea around in Safetyville and refine it—or throw it out in the field, raw! It's not perfect but it's simple and cheap enough for local funding. We don't have to lose birds "For Want of A Warning."

Maj Guy C. Cisco Jr
Chief of Maintenance
32 FIS, APO 292 New York

RADIALS vs. MAGNETIC HEADING

Approximately ten years of experience have been garnered in planning, directing and flying aircraft by use of radials rather than headings.

I have yet to meet the pilot that will admit he really prefers use of radials to magnetic heading, and I meet dozens of jockies who are spring-loaded in the verbose position to enumerate the pitfalls of directing the aircraft by the use of radials.

The most common complaint is the one additional arithmetical gymnastic required to convert a radial to a heading. Transposition is not a natural reaction. True, subtracting or adding 180 degrees doesn't require a mathematical genius, especially in an air-conditioned center, but when letting down IFR through mountainous terrain at night with moderate turbulence, nothing could be more disconcerting than to be carrying out your previous acknowledged instruction of descending on a heading of 247 degrees, somewhere near 1000 fpm, and have some completely unbiased controller proudly announce that you are now cleared to 5000 feet, intercept inbound radial of 067 and intercept a fix that may well be in Lower Slobovia rather than the intersection of two well known VORs in the Southern Sierras, and establish a non-standard holding pattern, etc.

Your first reaction is to bend her hard to the right, when, if you're lucky enough to have a smart copilot or navigator, he very gingerly touches you on the shoulder, and in a very ingratiating tone, asks, "Where are you going, Boss?" Or if you are driving along in a one-seat bird utilizing high altitude charts, you quickly grab the knee pad for a fistful of low altitude charts and flip frantically through the assorted documents to find the frequencies required to identify this nebulous intersection. All of which tends to distract you from the primary mission of fly-

continued on page 28

FRONT COVER PICTURE

A zero altitude, zero airspeed ejection system is shown during a demonstration by the manufacturer, Weber Aircraft. Photo credit, San Diego Union-Tribune.

THE IPIS APPROACH

By the USAF Instrument Pilot Instructor School, (ATC)) Randolph AFB, Texas

"The IPIS Approach," is a new feature in AEROSPACE SAFETY magazine. It's an Instrument Pilot Instructor School (IPIS) idea. "We get letters," they say, "and all of these letters have one common denominator—the need for more information on instrument flying. Because one of our missions at USAF IPIS is to standardize and promote techniques of instrument flying in the Air Force we have developed this column to aid the flow of information—in both directions.

"We want your questions and comments on all aspects of instrument flying, including flight instruments, navigational aids, weather, flight planning, regulations and publications, procedures, technique, or any other area."

Following is the first column. How valuable this column becomes is entirely up to you, the reader. Send your question to Air Training Command, Attn: IPIS, Randolph AFB, Texas, or to the Editor, AEROSPACE SAFETY magazine.

Q. Should the pilot plan to be at the holding fix or the initial approach fix (IAF) at the expected approach clearance time (EAC)? (Example: England AFB, La.)

A. For TACAN holding where the IAF is not located within the published holding pattern, the pattern should be adjusted so as to be at the published point of departure from the holding pattern at the EAC.

Where the IAF is located within the published holding pattern, the pattern should be adjusted so as to be at the IAF at the EAC.

A different procedure is necessary when two-way radio failure is experienced during TACAN holding. If this occurs, you should be ready to begin your approach at your EAC, whether the IAF is located within or outside the TACAN holding pattern. In other words, if at all possible, be at the IAF at your EAC with two-way radio failure.

Q. Is it legal to perform a penetration on a VORTAC facility using TACAN only when it is published as a VOR approach? (Example: Amarillo AFB, Tex.)

A. The correct response to this question centers on the word "compatible" as used in paragraph 40c, AFR 60-16A. There appear to be two viewpoints as to what constitutes "compatible" navigational equipment – those of the pilot versus those of air traffic controllers. Since the facility is a VORTAC, the aircraft's TACAN equipment is capable of providing adequate navigational guidance for the penetration and approach. Therefore, it is logical for the pilot to assume that his equipment is "compatible." From an air traffic control viewpoint, a pilot can not be cleared for an instrument approach unless it is published. In the absence of a published TACAN or VOR/TACAN approach, there is no assurance that such a procedure has been flight checked and approved. The only safe answer is that a penetration and approach using TACAN in lieu of VOR is not authorized.

POINT TO PONDER. You have planned an IFR flight with a total distance to destination and alternate that is approaching the maximum for your type jet aircraft. The weather forecast is such that IFR conditions will be encountered throughout the flight. You file for FL 350, specify a Gin Mill #2 SID; and then call for your clearance after arriving at the aircraft. The clearance you receive reads: "ATC clears AF jet 12345 to the Cornsville Airport, via Gin Mill intersection, direct Blotsburg VOR, flight planned route. Maintain FL 230. Expect further altitude change enroute. Gin Mill #2 departure. Maintain 4000 until 13 miles southeast. Reply Mode 3, Code 10. Contact Orville Departure Control on 397.2 after airborne."

Would you accept this clearance? Several factors must be considered, especially since you're pushing your maximum range for fuel on board.

- Can you make it all the way to destination at FL 230 if you lose two-way radio communication? Your clearance assigns you an altitude in the highest route structure filed, so you have to maintain that altitude. If you can't make it, don't accept the clearance.
- Suppose that your original clearance specified that you maintain 17,000. Since this is not in the highest route structure filed, you really have a problem if you lose two-way radio communications. ATC has not, in this case, given you an expected altitude so you are expected to maintain 17,000 until you are ten minutes beyond the first compulsory reporting point; then you climb to the lowest cardinal altitude (thousand foot levels) at or above the MEA of the highest route structure filed – THAT'S FL 180. Can you make it to your destination?

We think your best procedure would be to refuse the clearance unless it is specifically amended to include an altitude to which you can expect to be cleared at a given fix or time. Then if you lose two-way communications you have an altitude assignment which is compatible with your flight.

These are only a small sampling of the type of questions we receive continuously. Some are complicated, others are not, but the important thing is . . . some pilot was interested enough in his profession (and his neck) to ask the question. So it's up to you to make sure that "We Get Letters" and we guarantee "You Will Get Answers." ☆

LIKE A ROSE....

A Plane Is A Plane Is A

THIS GOES FOR THE LITTLE FELLAS, TOO.

The old boxing axiom "The bigger they come the harder they fall" may be apt for fisticuffs but hardly applies to airplanes. Experience over the past few years indicates that a more accurate saying in reference to USAF utility aircraft would be something like "as small as they are, they still fall pretty hard." The U-6's, U-10's and U-3's haven't been getting as much publicity as their bigger and faster brothers, but they have been involved in a flock of accidents costly in both lives and equipment.

There are a lot of reasons for these accidents – almost all are tagged with a specific cause factor –but too often the reasons do not seem compatible with the image of the professional Air Force pilot. What are the real reasons? Complacency? There's a word that has been kicked all over the lot. Are pilots who are accustomed to flying bigger and faster equipment overly complacent when they get their hands on the controls of a U-3? Perhaps. Careful study of these accidents, however, leaves considerable doubt as to pinning the blame on the vague term complacency. The closest answer seems to be lack of pilot proficiency or in plainer words: heads up and locked piloting.

Take the fellow that ran his blue canoe out of petrol at night with three passengers aboard. He demonstrated a high degree of proficiency in being able to make a gear up landing at night in the snow. There was some doubt, however, as to his ability to flight plan and manage his fuel. Lack of judgment seems to fit this case like a perfect 36.

This flight started out at Point A and proceeded to Point B, where there was a lack of alacrity on the part of transient maintenance in putting gas in the tanks. The crew decided they had enough anyway so they didn't wait around for the gas truck.

They flew back to Point A, where they didn't land but made a turn north and continued on to Point C where one of the pilots was offloaded. No gas was obtained there. The remaining pilot then took off and headed back to Point A. About 20 miles from Point A he became extremely concerned with his fuel situation. So he did a 180 and headed for Point D, a civil airport between Points A and C. The fact that D was 40 miles away compared with 20 miles to Point A didn't occur to him. Six miles short of Point D the tanks went dry. You know the rest.

There were a whole bunch of discrepancies in this pilot's statements about fuel consumption: He said that on one leg it was 19½ gph. On another leg it was just a fraction of a gallon higher, but on the third leg, WOW! That U-Bird was gulping it up at nearly 46 gph.

Investigators took a look at this seeming paradox and also had the gages tested. Their findings: the gages were right on the money, in fact more accurate than most. The pilot tried to fly a 138 gallon flight on 132 gallons of fuel.

MOUNTAINS AND CANYONS

There have been some cases in which pilots flew into mountainsides with the loss of all aboard. One got himself into a canyon he had no business being in and couldn't get out. Another – well, Plane

instead of going into all the details we'll put it into the context of a problem. See if you can figure out what happened from the recommendations made by the accident investigation board. "Recommend the importance of the following be stressed:

• "Maintaining exact airways navigation.

• "Utilizing all available navigation equipment.

• "Being positive of position prior to accepting descent and approach clearances."

After investigating the mishap in which the aircraft was trapped in a canyon, the board tagged the pilot with the accident because he attempted to fly a VFR course through mountainous terrain during marginal weather conditions. One of the recommendations seems to have a lot of sense to it. In essence airdrome officers and dispatchers should place more emphasis on advising pilots of hazards, particularly when they will be departing airways and crossing mountains. Meeting incoming aircraft is commendable, but saving lives is more important.

Then there was the fouled-up episode in which three pilots finally totalled out their aircraft but managed to walk away with no serious injuries. These fellows were flying a U-3B when they decided to land at a civil airport and take on some fuel, because the winds were stronger than expected. They got gas and put a couple of quarts of oil into Nr 2 engine. This made sense, but what follows—you be the judge.

Despite a SIGMET warning of severe turbulence due to high winds and an enroute station reporting three miles with rain showers and fog, they filed a VFR flight plan. Takeoff was late in the evening, pretty close to dusk. Twenty minutes later the aircraft was forced down to 3500 feet by a stratus layer so they decided to return to the airport where they had fueled. During the turn Nr 2 RPM fluctuated and there was a 10 psi oil pressure drop. The other gages read okay so the pilot didn't get upset. About five minutes later the RPM started jumping between 1200 and 2700 and oil pressure went to zero.

During this fluctuation the pilot noted that Nr 1 RPM was lower than Nr 2 so he feathered Nr 1. Immediately Nr 2 froze. Obviously this called for some kind of action, so Nr 1 was brought back in. Feathering Nr 2 proved to be impossible so the RPM on Nr 1 was advanced to 2450 and the throttle to 24 in. Hg in an attempt to hold 110 mph. Altitude now was 2500 feet. Full power was now selected; even so, the aircraft was unable to maintain altitude and airspeed, primarily because of the turbulence and maneuvers to avoid hitting the hills.

Now the aircraft was at 1500 feet, down in a valley formed by a 1700-foot ridge shaped like a horse shoe. At this point the decision was made to make a forced landing and give up the attempt to make it back to the airport. The gear up landing was smooth but ground undulations and a fence damaged the aircraft to the extent that it was considered beyond repair.

One could argue that the primary cause for this accident was engine failure. On the contrary, pilot factor could be considered the cause, which is the way the board decided based on the following:

• Failure to identify the failing engine which would have permitted feathering prior to seizure.

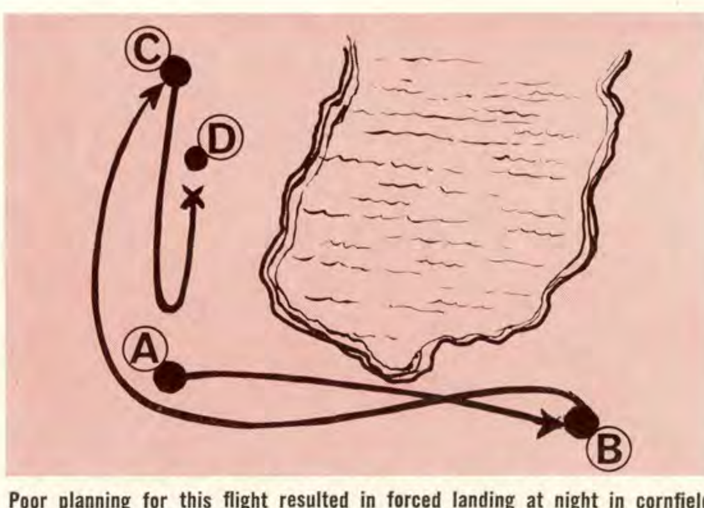
• The pilot feathered the wrong engine.

• Failure to establish maximum power immediately after restarting Nr 1 engine.

There were a flock of contributing causes ranging from materiel failure within the Nr 2 engine to some more omissions and commissions on the part of the pilot.

INSTRUMENT ERROR

Now consider the case of a hard landing in a U-3. This can happen to anybody. You bet, but this one



Poor planning for this flight resulted in forced landing at night in cornfield. Pilot tried to fly 138-gallon-flight on 132 gallons of fuel.

"Even the smaller airplanes the Air Force has take a tragic toll."

got a little complicated. Seems this man was flying an aircraft in which the airspeed indicator was known to have at least a 10 mph error on the high side. It had been released for flight with this condition.

The pilot hadn't flown the canoe for several months so he got a one-hour checkout and then went up solo. In the pattern he called the tower and was given his choice of two runways, one 5000 feet long and the other 2500 feet. Naturally, he chose the short one. He was a little high on final so he chopped the throttle to 12 inches. Wind was light and he maintained 95 mph indicated to flare. When the aircraft was flared at 30 feet above the ground two things happened simultaneously: the stall warning blew and the aircraft stalled completely. It came down hard on the left gear, bounced onto the nose gear and then the right gear. Fortunately the thing hung together and the pilot taxied it to the parking area. When they got around to looking the bird over, it was found that it needed a whole list of things including a new left prop, left engine, left gear, brakes and tire, wing panel, etc, etc.

During his checkout the pilot had been warned of the error in the airspeed indicator. Actually the error was greater than reported (as discovered in later tests) and when the aircraft flared for landing it was right on the edge of a stall. At rotation for landing, out went the bottom and down went the airplane.

Now the owner of the pilot and the owner of the aircraft were not the same. The investigators were on the pilot's team and they found that the primary cause was maintenance error, i.e., release of the aircraft with a known airspeed indicator error.

The owners of the aircraft saw things differently; they seemed to feel that the pilot had ample warning of the error, that he failed to compensate for it and therefore was to blame. You pay your money and take your choice.

Sometimes a pilot gets boxed into a situation where the outcome might depend upon luck as much as skill. One night awhile back a U-10 was taking off from an unlighted strip. In the right seat was another pilot along as an observer; in the rear was a passenger who had been picked up at the strip as part of an exfiltration mission. Just after takeoff, when the aircraft was at about 200 feet, the engine lost power. The aircraft was in a shallow turn to the left. The pilot quickly turned back to the right for an attempt to land on the remaining runway. The aircraft hit, bounced, rolled across a road and into a clump of trees. There were no injuries.

Although the exact cause of this accident was never determined by the board, the most probable cause, according to the investigators, was that the right seat observer accidentally turned the fuel control partially or fully off with his foot when he turned around to assist the back seat passenger get aboard and strap in. (The major air command determined the cause to be pilot factor, in that the pilot turned at too low an altitude and hit the trees.)

Brake failure, the kind that gives one that helpless feeling, resulted in two accidents involving three U-3s. In one of these the right brake failed and the aircraft ran into a curb along the edge of the parking area. The other one was a little more serious in that a U-3 being taxied to the ramp collided with another U-Bird causing extensive damage. In this case, it was determined that overheating caused by excessive braking during landing and taxiing caused the brake to fail.

Even the smaller airplanes the Air Force has take a tragic toll. A few minutes after takeoff the engine of a U-6 appeared to witnesses on the ground to lose power. The aircraft descended to within 150 feet of some trees then seemed to regain power and begin a climb. It levelled out for a short distance and a left turn was begun. The next observer saw the aircraft in a descending left bank with no apparent power although the propeller was rotating. By now the aircraft was just clearing the trees. The engine appeared to start then the aircraft struck a tree, went into a steep right bank and finally crashed after striking more trees.

Whether the engine failed or the pilot was simulating forced landings is unknown. The Board concluded that, if the engine was malfunctioning, the pilot used poor judgment in not making a landing at the first sign of trouble. Even if the engine came back in, it was not wise to continue flight over a hilly wooded area with an engine that was malfunctioning.

If the original low approach was to simulate a forced landing, then poor judgment was exhibited in maintaining flight at such a low altitude that when an actual emergency occurred there was no maneuvering room.

Even though materiel failure of the engine might have been involved, the most probable cause of this accident was determined to be pilot factor either because of poor judgment or because of the possibility of the pilot failing to properly clear the engine after power reduction during a simulated forced landing.

One more example before concluding this summary: The pilot of a U-10 took off on a 2500 foot strip at 4300 feet elevation. Take off run was about 600 feet. The pilot reduced RPM and about 10 seconds later decided that he could not clear a bunch of trees straight ahead nor could he avoid them by turning. He raised the nose and just prior to impact closed the throttle. Was the fact that no one was injured due to pilot skill or pure luck?

These are just a few examples, selected at random from the approximately 30 accidents in which light aircraft have been involved during the past two years. Some were the result of factors beyond the pilot's control; most, however, were caused by the actions of the pilot. This hardly agrees with the image of the Air Force pilot as a professional.

Paradoxically the pilots involved were successful in flying much more sophisticated aircraft. Why then did they prang the little birds?

These accidents indicate that checkout procedures have not been thorough for some pilots of utility aircraft. There also appears to be a tendency toward an attitude of "I can get away with it" that would not appear in respect to larger, faster aircraft.

Review of light aircraft accidents indicates that pilots don't thoroughly study the Dash One. Emergency procedures and performance data are important regardless of the size of the airframe. The physical laws governing aircraft performance are the same for a Mach 2 fighter, a jet bomber or a U-3. Ignore them and you're in trouble, regardless of the aircraft type. Treat the little birds with the same respect you give their big brothers and they'll respond likewise. Show them contempt and they're liable to repay you in kind.

Correction of these two items, insufficient checkouts and lack of respect for utility aircraft, can prevent many of these needless and sometimes fatal accidents. ☆

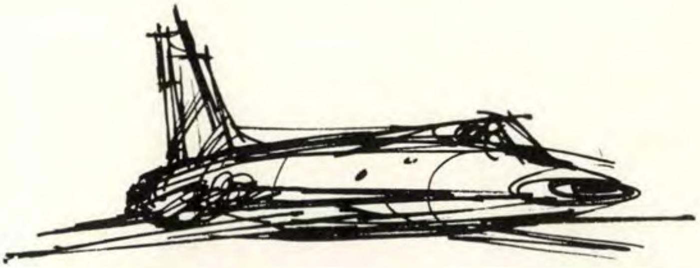
Robert W. Harrison

AGAIN... USAF WINS SAFETY COUNCIL AWARD

Presentation of the National Safety Council Award of Honor to the Air Force is made to Secretary Eugene Zuckert by Howard Pyle, President of the National Safety Council. Other persons attending the presentation are (L-R): W. G. Weller, Office of the Inspector General; Vice Chief of Staff, General John P. McConnell; Secretary Zuckert; Mr. Pyle, and The Inspector General, Lt General Keith K. Compton. This is the fourteenth consecutive year that the Air Force has won the National Safety Council Award of Honor. Four Air Force Commands received the award: USAFA, CONAC, MATS and TAC. The award is based on military and civilian fatality and injury rates, Air Force motor vehicle accident rate and accident cost index.

MORE ALIVE in '65

Each year's safety program in the Air Force is based, to a large extent, on recommendations made at the Annual Safety Congress. This article relates the highlights of the 1965 Congress held at Maxwell AFB. Here are proposed safety planks of the platform for the 1965 campaign.



FLIGHT SAFETY

Improved accident investigations will result if the objective of Flight Safety Seminar No. 1 is achieved. Safety surveys, staff assistance visits and accident reports coming into the Directorate of Aerospace Safety indicate that accident investigations need to be improved. If you do not have one now, the word is, prepare a pre-accident plan. This plan should spell out individual and agency responsibilities, require board members to be placed on orders, insure that other duties will not interfere with active board members' obligations and delineate support obligations. A pre-accident plan, developed at the congress, is expected to be distributed to field units for their use in preparing their own plans.

Because civil authorities often reach the sites of off base military accidents prior to military investigators, an educational program is being prepared to better acquaint such authorities with assistance they can provide. Letters and brochures are to be sent to all bases. The Directorate of Aerospace Safety, in conjunction with the Army and Navy safety centers, is working on a film to be used in this program. Help from civil authorities and preplanned and trained investigation boards are expected to aid in reducing the number of "undetermined" category accidents.

Another area, better reporting and analysis, is to get more emphasis during 1965. As was pointed out during the seminar, facts discovered but not reported have little value in the accident prevention program. Commands are asked to conduct extensive educational campaigns on proper preparation of accident and incident reports, operational hazard reports, emergency unsatisfactory reports, quality control deficiency reports and unsatisfactory reports. The Directorate of Aerospace Safety plans to support this campaign in the safety education publications. This will also be a special subject in 1965 during staff assistance visits and safety surveys.

Last year a new AFLC organization, the Materiel Safety Center, was established and partially manned. Under this concept safety problems associated with materiel deficiencies are more expeditiously identified by AFLC and directed to an appropriate agency for correction. The consensus of seminar members was that this approach should be more effective than the Top Ten program (outlined the top ten materiel deficiencies of each major command) and that Top Ten should be dropped. A drawback to the Top Ten program was slow or incomplete action to overcome reported deficiencies.

Another major effort area proposed is an all out drive to improve quality at all levels, from Flight Line Maintenance to the AMA's and to Industry. Quality Control is scheduled to be a special inspection subject. Seminar members went on record recommending that AFSC and AFLC should act vigorously and expeditiously to insure improved quality.

Fire warning system troubles are in for added emphasis. The special seminar set up to explore this area contended that timely warning of overheat and fire is of vital importance to aircrews and that deactivation of the system is not the answer. System modification, better maintenance of present systems and development of new concepts and systems are suggested.

The excessive backlog of Time Compliance Tech Orders is in for a hard look. In some cases, the delay in accomplishment permits the T.O. to be rescinded before it is complied with. The report explains that the problem is compounded by the existing TCTO backlog coupled with maintenance manpower shortages, insufficient aircraft downtime and a reluctance to issue Safety of Flight T.O.'s.

Since statistics show an increase in maintenance-induced accidents, this area too is expected to receive special attention in '65. Changes anticipated include a motivation program aimed at overall improvement of maintenance practices. Maximum monthly or weekly duty hours are recommended (an approach similar to the crew duty hours limitations for aircrews). Commanders are urged to establish programs to more adequately recognize the contributions of maintenance personnel. Increased maintenance manning is sought in view of current trends in maintenance factor accidents.

GROUND SAFETY

Industrial, traffic and explosives safety were the three principal areas investigated by delegates and these are the areas expected to receive special attention in 1965. In addition, special subjects included areas of sports and recreation, military field exercises and safety programs.

Implementation of "Problem Priority Profile," a managerial technique which looks at the industrial safety problem on a priority basis, is urged for each major command, with results to be reported at the next safety congress. Because of the many processes involved in Air Force industrial activity, this profile approach is proposed as a means of coping with the myriad industrial accident problems.

Again, because vehicle accidents continue to be the main cause of personnel losses in the Air Force, this problem was a major agenda item. For 1965 a 40 point program called "USAF Private Vehicle Action Program" has been prepared in an effort to most efficiently combat this hazard. The following are highlights of this program:

Traffic safety indoctrination training for non-prior service airmen and young officers.

Development and publication of a traffic safety manual.

A team approach at major and subordinate command levels.

Use of a traffic safety program inventory at base level to evaluate program requirements and measure program progress.

Continued emphasis on seat belts, with the goal of belts being required as a prerequisite for registration of private vehicles on Air Force bases.

Seminar 3 dealt with the problem of protection devices at explosives storage facilities which provide only a minimum degree of protection to personnel outside the work area. The delegates recommended that a new design be developed with respect to handling and processing facilities to afford a greater degree of protection for personnel and equipment. The results of the explosives tests indicated that exposures to explosives hazards should be re-evaluated to minimize the number of activities and reduce the number of personnel within the operating buildings.

Transportation of explosives was a matter of particular concern. Areas for parking of aircraft, in-transit holding and common terminology were subjects considered.

Clarification and publication of more up-to-date guidance for field units is expected to provide for greater safety in this area. Of special concern was handling, storing and maintenance of CB systems. In the area of explosives safety, better definition of personnel duties was isolated as an area of concern for 1965.

Look for more emphasis on sports and recreational accidents during 1965. Over 2000 such accidents occur to Air Force personnel each year. The tab comes to $8,000 per day. More stringent safety requirements can be anticipated.

Past experience has shown that greater safety planning is essential in military exercises, particularly on the flight line complex. Look for guidance on such things as use of hand signals, loading and unloading, better communications and coordination.

Abbreviated accident reporting procedures are to be further refined. Past field tests have shown advantages for reporting organizations, major commands, and Hq, USAF. Misinterpretations and ambiguities are being clarified.

Seminar 10 came up with proposals designed to better spell out ground and explosives training requirements.

MISSILE SAFETY

The USAF Missile Accident Prevention Plan for 1965 was developed by three seminar working groups and centers around three major areas:

- Hazard Analysis Program
- Supervisory Safety Training
- Composite Safety Survey.

To reduce hazards they must first be recognized. The following tools of identification are recommended:

- Job review
- Facility review
- Support review
- Hazard reporting
- Safety surveys
- Military suggestion program
- AFM 66-1 data
- T.O. 00-35D-54 reporting.

And here are the recommended actions after the hazards are identified. If not correctable, take action through established Air Force channels to:

Modify the hardware and facilities.

Change tech data and procedures.

Document the hazards.

Disseminate the information.

Insure adequate pretask briefings.

Placard and distinctly mark as appropriate.

Seminar 2 dealt with Supervisors' Safety Training. Conferees asserted that the proper method and most logical way of making missile personnel safety conscious is through the supervisor. A safety education effort aimed toward defining supervisors' responsibilities is programmed in safety magazines, films, kits, bulletins and the TIG Brief. Additional proposals include: development of Air Force regs, letters reviewing supervisory deficiencies of serious accident potential and inclusion of safety psychology in formal Air Force schools.

The third Missile Safety Seminar dealt with establishment of a composite missile safety survey method for like weapons systems. This concept is based on ADC's BOMARC survey method. Each commander loses the services of his safety officer for one week each two months, but annually has the services of six safety officers for a one-week period. Mishap prevention and assisance to individual units are the objectives. Benefits include:

Standardization of missile safety programs.

First-hand information on problem areas and how they are being handled.

Sharing of new ideas and exchanging of safety information.

The TAC proposed revision of officer classification to clarify MSO and FSO responsibilities regarding air launched missiles was also discussed. It was recommended that the Director of Aerospace Safety conduct a study on this matter.

CONCLUSION

These are some of the safety activities we can look for in 1965. With increased emphasis on cost reduction programs, accident prevention plays an ever-increasing role. Losses that are preventable cannot be tolerated. Each and every person in the Air Force — military and civilian — can help. ☆

MOUNTAIN WAVE

Last winter an Air Force B-52 on loan to the manufacturer was on a low altitude mission to study turbulence effects on the aircraft's structure. The aircraft literally lost its tail in clear air turbulence on the lee side of Spanish Peak in the Colorado Rockies.

Thanks to superlative airmanship and radioed assistance from skilled aerodynamic specialists, the crew was able to safely land their specially instrumented craft. They had tangled with severe mountain wave turbulence. Other air crews have not been as fortunate. Structural damage has resulted in loss of control and aircraft destruction.

The mountain wave phenomenon occurs when wind flows across a mountain or ridge of mountains. The rule of thumb has long been to avoid flight in such areas when the wind component perpendicular to the ridge exceeds 25 knots. If such areas cannot be circumnavigated it is recommended that flight across the ridge be at least 50 per cent higher than the height of the range. This is not, of course, a guarantee of smooth, safe flight, since effects of mountain waves can extend as high as 70,000 feet.

There are clues to mountain wave turbulence that should enable the alert pilot to avoid this hazard. The first and probably the best is to always obtain a preflight briefing on your route of flight from a qualified forecaster. Study of winds aloft charts should provide fairly reliable indications of the potential for mountain wave turbulence. Enroute, listening to pilot reports, checks on Channel 13 with metro stations along the way, monitoring weather reports by Flight Service Stations and observation of cloud formations for the tell-tale clouds frequently associated with mountain wave conditions should serve to keep the alert pilot clear of this hazard.

Here are the cloud formations that indicate the existence of mountain wave turbulence:

Cap clouds. These hug the tops of mountains and may flow down the leeside like a waterfall. Such cloud formations are known as foehnwall clouds and may contain downdrafts of as much as 5000 feet per minute.

A cap or foehnwall cloud, severe downdrafts.

Typical mountain wave clouds seen from above.

This lenticular is ragged, expect turbulence.

Roll clouds. As the wind spills down the side of the mountain and reaches the valley surface it shoots up again, is cooled, and moisture condenses into clouds that have a distinctive roll or rotor motion. The base of the roll cloud may be below the mountain peak and its top well above. More than one such cloud may form downwind from the mountain as the wind flows down, then up again in successive waves. Updrafts of up to 5000 feet per minute can be experienced on the upwind side of these clouds and downdrafts of the same velocity on the downwind side. Such windflows produce sharp shear areas and extreme turbulence. Pilots have reported turbulence in these areas to be more severe than that normally experienced in thunderstorms.

Lenticular clouds. These clouds, distinctively lens-shaped and frequently seen over the Sierras, form above the roll clouds and, like the roll clouds are stationary. Lenticular clouds are normally smooth. Occasionally a breakdown in the wind flow can cause turbulence. Severe turbulence is most likely to exist at the extreme altitude of the tops. If the lenticular is ragged, suspect turbulence and stay away. Allow ample clearance when flying in the vicinity of any of the mountain wave type clouds since the strong up and down drafts can carry your aircraft into the clouds and areas of greatest turbulence.

Mountain wave turbulence can occur without the presence of clouds. Checking wind speed by observing smoke and blowing dust and comparing ground speed with true airspeed and drift are warning signals for the alert pilot.

Loss of the tail of the B-52 is but one of many examples that have dramatically portrayed the hazard of the mountain wave. Years ago, during a mountain wave test program, a sailplane that was stressed to withstand 14G's was torn apart during flight through a mountain wave rotor cloud at Bishop, California. Though injured, the pilot was able to bail out successfully.

It this isn't inducement enough, remember too that turbulence of the mountain wave can mingle with the clear air turbulence of the jet stream, particularly in winter.☆

HOW SAFE?

Part I of a two-part series on determining the condition of the accident site, and the procedures for conducting a thorough investigation to determine the causes of the accident.

IT'S DONE — IT'S OVER — THE EXPLOSION HAS HAPPENED — THE FIRE IS DYING OUT!!

But somewhere inside the twisted, bent, burnt debris and rubble that was an operational silo lie some answers: the answer to what happened, the answer to why it happened, and the answer to what can be done to prevent its happening again. Those answers must be found as quickly as possible. The other missiles of that model may be in jeopardy. Some part may be defective; some procedure may be wrong; or some personnel training may be lacking.

The first thing that must be done is to conduct a silo safety evaluation. Based on experience gained from ICBM mishaps within the last year, the following is an outline of steps and precautions to be observed in conducting a silo safety evaluation prior to detailed accident investigation. While each different ICBM has its own support equipment peculiar to that weapon system, the basic missile vertical storage configuration is the same.

Major accidents have occurred with the missile and related equipment in varying stages of operation. Silo doors have been open when the big blow came, silo doors have been closed at the time of explosion, silo doors have been partially open when the missile was destroyed, and once the missile was up and locked when fire lapped around it. The end result has been the same in each case.

The silos received major damage each time. The main beams of the crib structures were twisted, bent, and warped. Wall concrete spalled onto stairways and throughout the silos in varying amounts. Fire further added to the scene of destruction by burning equipment which was not blown out.

The picture presented to arriving investigators is a bleak one and dictates that caution be the watchword. To have someone injured during the investigation is uncalled for, to say the least. Therefore, the policy is to "walk before you run."

The officer who is to be the complex commander during the investigation should get to the site as soon as possible after the explosion. We have learned that this is the first step. He should immediately establish in everyone's mind that he and he alone has assumed control and responsibility. To prevent debris disruption by the curious, as well as to keep the area clear during safeguarding operations, this procedure is a must. During these early phases, he must retain strict control until entry into the silo can be made. His vouching authority can be delegated to other accident investigation team members, but not his authority to control. To aid the new complex commander, an air policeman should be assigned to take charge of site security. He should be on duty at the site until the investigation is completed.

The initial site visit by the officer in charge is manyfold in purpose. In addition to securing the area, he should make a rough estimate of damage and determine equipment requirements. Experience indicates that if he arrives at the site within 24 hours after the explosion, he will find that fire or intense heat will still be emanating from the silo. This will, in all probability, decrease the next day and allow close silo observation. The first visit will tell the investigator the condition of the launch control area entry, the silo doors, the extent of gaseous vent damage. At this time it is important to note the location of topside debris in order to plan future equipment placement. At this time an assessment should be made as to the feasibility of allowing standby fire equipment and security personnel to move in closer to the perimeter area. Also, consideration should be given to establishing communications with the base. It is paramount that communications be effected as soon as possible. Time will be saved if this can be done by land line, at least to the security area.

Major Curtis N. Mozley, Directorate of Aerospace Safety

Subsiding of the fire will dictate the time schedule for silo safety evaluation. Normally, it has been possible to place a "purge" unit on the silo cap, blowing down into the silo, within 48 hours after the explosion. The purge unit should be placed so that the air flow is directed downward around the spiral staircase or ladders intended for future use. This downward flow of air will expedite the cooling of the silo and aid in dissipating gases from within the silo. A note of caution at this point: the purge unit trailer should remain attached to the tractor until all danger of fire flareup has passed. The support base should establish a service schedule for the purge unit as it must run continuously for many days and nights.

When an investigation is underway, a standing requirement exists for an on-site, standby ambulance as well as a fire truck. A 20-ton crane with new cable and a personnel "bucket" is mandatory. Again, the crane operator should be assigned to the accident board complex commander for the duration of the accident investigation. Continuity requires the operator to be thoroughly aware of the standard signals and what is being attempted. Also, the lowering of personnel into the silo by the "bucket" is a smoother, more confident operation, if the crane operator's capabilities are known.

Prior to entry into the silo proper, the topside must be made secure. Pictures should be taken of the cap area before debris is disturbed. All openings (air intakes, exhaust vents, the silo opening, etc.) must be cordoned off by chain, rope, or wooden barricade. If the silo doors are standing open, they should be secured so that it is impossible for them to close or fall open. This can be done by welding a shaft to the cap area or by fastening strong link chain to a suitable tie-down.

All vents should be free of debris or obstructions. High pressure gases as well as fuels and oxidizers have, in the past, continued to vent for days after the explosions have destroyed the remainder of the silo. If, as has happened, one of the silo doors has mashed some vents flat, it must be removed. Inasmuch as the weight of these doors exceeds the capability of most mobile cranes, a good way of movement is by the use of jacks and rollers. Insure that the intakes and exhausts are clear. This will, in conjunction with the operating "purge" unit, provide a path for air to circulate to and from the silo.

Remove all light weight pieces of debris from the silo opening and make sure they are tied down so they will not be moved by wind or by personnel. If all safety precautions have been taken topside, and if the heat has dropped in intensity, the initial entry can then be made into the launch control area. It is highly recommended that the most experienced personnel available make this initial entry. Two investigators and one base photographer should make the penetration. Before they enter they should review statements from those who evacuated the launch control area after the explosion/fire. These statements can provide clues as to any structural damage that may be encountered. A safety man should be positioned at the top of the entrance stairway. Entering personnel will carry a portable oxygen analyzer and take samples at least every five feet of descent. Also, an explosimeter will be carried and readings taken as the oxygen content is checked. Scott Air Paks will be worn during the initial penetration and until it has been determined that the air is safe. No pictures should be taken until after the explosimeter has been checked—an exploding flash bulb could trigger an explosion of trapped gases. If available, a strobe light should be used.

Personnel entering the launch console area may notice a smell of burnt paint, dust, and acrid odors even though the oxygen reading is normal. After the explosimeter reading indicates all is safe, pictures of the area should be taken. All charts, pieces of equipment, consoles, loose papers—in fact, everything in the room(s)

Purge unit provides downward flow of air for cooling and dissipation of gases. Immediate service of unit must be available.

should be photographed. Classified papers should not be touched; firearms, watches, etc., should not be disturbed. (A designated classified control officer from the base should accompany the team making the next entry into the launch console area. He should pick up all classified material and loose items of value having no bearing on the investigation. These should be inventoried and a copy of the inventory left with the accident site complex commander.)

Emphasis should be placed on pictures of indicating equipment such as facilities remote control panels, diesel engine panels, tanking panels, etc. Be sure to photograph any electric clocks to aid in timing sequence of events.

During the initial launch control area penetration, analysis can be made to determine feasibility of subsequent connection of electrical power, communications, and water facilities into the launch console room area.

This initial penetration can be done with flashlight illumination, but each base has 9-volt Porta Lights available. (These should be checked periodically, for experience shows they are a must for silo penetration after a major accident.)

Once the launch control area has been judged safe for further entries, the pentration of the silo proper can be programmed. More people and equipment will be required. Again, and of utmost importance, an experienced penetration team leader is required. Other team members should include a member of the accident investigation team, the local missile safety officer, and the base photographer

The crane should be exercised by swinging the personnel bucket over into the "hole" and back. This will determine boom position for future use. Strong nylon rope, a portable fire extinguisher, two safety belts, two Scott Air Paks, and a hand-held bull horn should be prepositioned in the personnel bucket. Each man should have a whistle and understand signals to topside. A topside (cap) safety observer should be designated to direct the crane, if required, and to monitor the penetrating team. He should confirm hand signals with the crane operator, as well as be prepared to go into the silo in the personnel bucket for rescue purposes.

Assuming the silo can be entered through the launch control area, a safety observer should accompany the team to the first level entered from the silo tunnel. He will position himself so as to observe the team as downward progress is made.

With the exception of the photographer, each team member should carry a 9-volt Porta Light with new battery and wear a safety belt with loop. All penetrating personnel should wear Scott Air Paks and the team leader should carry a calibrated oxygen analyzer. He should also carry a miniature portable tape recorder and record his observations as penetration is made. The unit missile safety officer should follow the team leader and carry the explosimeter as well as a 100-foot coil of strong nylon rope. The other accident investigation team member should be responsible for the photographer and determining pictures to be taken. He can also be the time monitor. (The endurance of the air-breathing apparatus dictates that, in the event of contaminated air, egress from the silo depths must be within a specified time period.) In addition, this team member should carry a small, hand fire extinguisher since small fires have smoldered within the silo for days.

The base photographer should be suitably dressed in one-piece coveralls and have enough portable equipment to take 100 pictures on the initial silo penetration.

Prior to opening the blast doors, the team leader will check the tunnel area for oxygen content. Care should be taken as the doors are opened because hanging debris or concrete could be disturbed. Grating or flooring should be checked very carefully as progress is made.

The penetration should not be hurried and pictures should be taken as the team works its way from level to level. All previous accidents have showered spalled concrete throughout the silo and especially on the staircase. With care, all stairways were usable, but footing on spalled concrete is insecure at best. Movement on the stairways, initially, should be restricted to one man at a time. It is conceivable that loose concrete cascading downward could cause either a secondary explosion or further silo damage.

Oxygen and explosimeter readings must be taken at each level and downward progress should be predicated on the readings obtained at higher levels. Hissing noises, splashing sounds, and eerie burps will probably be heard. The escaping high-pressure gases and stored propellant create noises fit for "Outer Limits." The sight of liquid oxygen spurting from a fractured line connection or a loose vibrating gaseous nitrogen line add emphasis to the watchword—CAUTION.

These are considerations as the silo safety evaluation is made. If more time is required for LOX boiloff or trapped pressures to vent, confine further investigative efforts to areas that are well clear of the hazard area. Monitor the venting gases on a daily basis until all is clear or adjudged to be safe, but don't take needless chances.

The answer must be found, true, but safety must always be paramount in an investigation of this kind.

(The second part of this two-part series will appear in the February issue.) ☆

Rex Riley's CROSS COUNTRY NOTES

CHECKLISTS, HORNS AND REMINDERS — By the time this gets into your hands, the story may have changed but as of now, meaning right now with ol' Rex sittin' here with the message in his hands, there have been six gear up landings so far (1964) in which the pilots were at fault. That means six scratched up—or worse—airplanes and more than six mighty embarrassed pilots. The aircraft involved were trainers, fighters and transports. One resulted in a major accident, three were minors and two were incidents.

Now one way of putting a stop to this kind of nonsense would be to weld all the gears in the down position. This not being practical, we had better look to better methods. For one thing, commanders and safety officers can bring this problem to the attention of all pilots—let 'em know that this method of landing is 180 out of phase with the book and all we've been teaching all these years.

You might have a little talk with the tower people. If they don't know, they should be made well aware of what can happen when a pilot is distracted by chatter from the tower while he's in the midst of a before landing check.

Also, controllers could put a mite more emphasis in checking with the pilot for gear down. Rex suspects that biggest part of the time this is a routine sort of thing, like a friend of mine who scratches his nose every time he rolls out on final. Nervous habit, I guess.

While we're on the subject, it might be a good idea

to remind pilots that FAA towers do not give oral gear checks in their landing instructions.

'Nother thing sorta griped Rex when he heard about it. Seems a pilot could not be given go-around advice because mobile was out of service returning from base operations after exchanging duty officers. Wonder if they drive the mobile in for lunch too? Surely there are some other vehicles around to drive the duty officers to and from. Anyway, who was handling the landing in this case? Was the tower out of business too?

Anyway you slice it, gear up landings—when the gear works okay—are inexcusable. We have checklists, horns, reminder by the controller and lights in the cockpits. What else do we need to finally put an end to this expensive, highly unprofessional and dangerous practice?

SOME COMMENTS ON EMERGENCIES: Every once in a while Rex finds himself sitting in on a bull session on emergencies. There are several schools of thought that can be pretty well categorized:

- Do everything exactly by the book—if you bend the bird at least it's not your fault. Exponents of this course of action contend it is better to do major damage, and do it by the book, than to deviate and possibly do less damage, but run the risk of criticism for deviations.
- Know the systems, and react accordingly, using the "book" solution only as a guide.
- Do as you like, using as your authority the Dash One paragraph that contains the statement: The manual provides the best possible operating instructions under most circumstances, but it is not a substitute for sound judgment.

It would appear that the above three schools of thought would be enough to cover most any course of action. Not so. Shocking as it may seem, Rex was recently told by a pilot who did not know the engine failure emergency procedure: "It's not important anyway—how often does anyone actually have an engine failure in this airplane?"

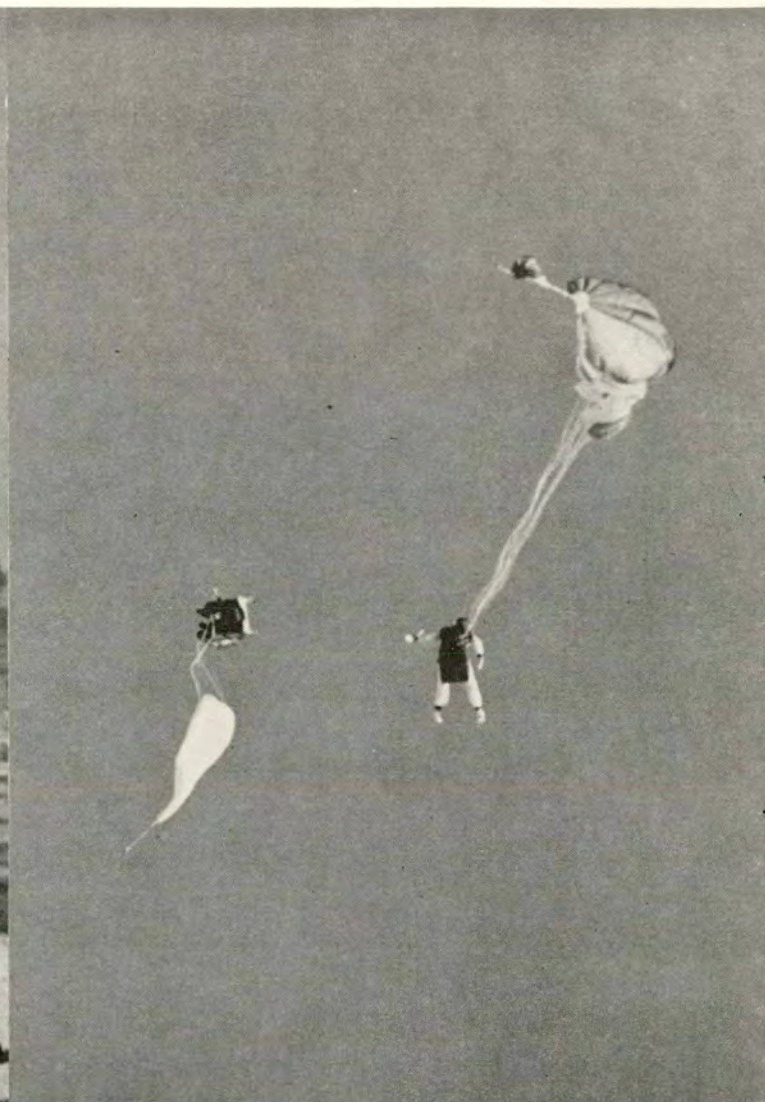
Well now, this is the attitude that really drives me to get out the soap box. How would you like to be riding in the back seat with a guy up front who doesn't know his emergencies "because they don't occur often?" You wouldn't accept this philosophy on the part of the doctor who might be called upon to operate on you. Still, how often do you need an operation? Your life can be at stake in either case.

It all leads back to one of Rex's favorite subjects—professionalism. Rex likes to think that his fellow Air Force Pilots are real professionals who take pride in their work. Most are. We don't hear much about them because they go along, day after day, doing the job. They are the ones who know their aircraft systems, know their emergency procedures and know how to use common sense. They are the ones who convert a routine inflight emergency into a routine landing.

They're the ones I want up front. How about you?

Rex Riley

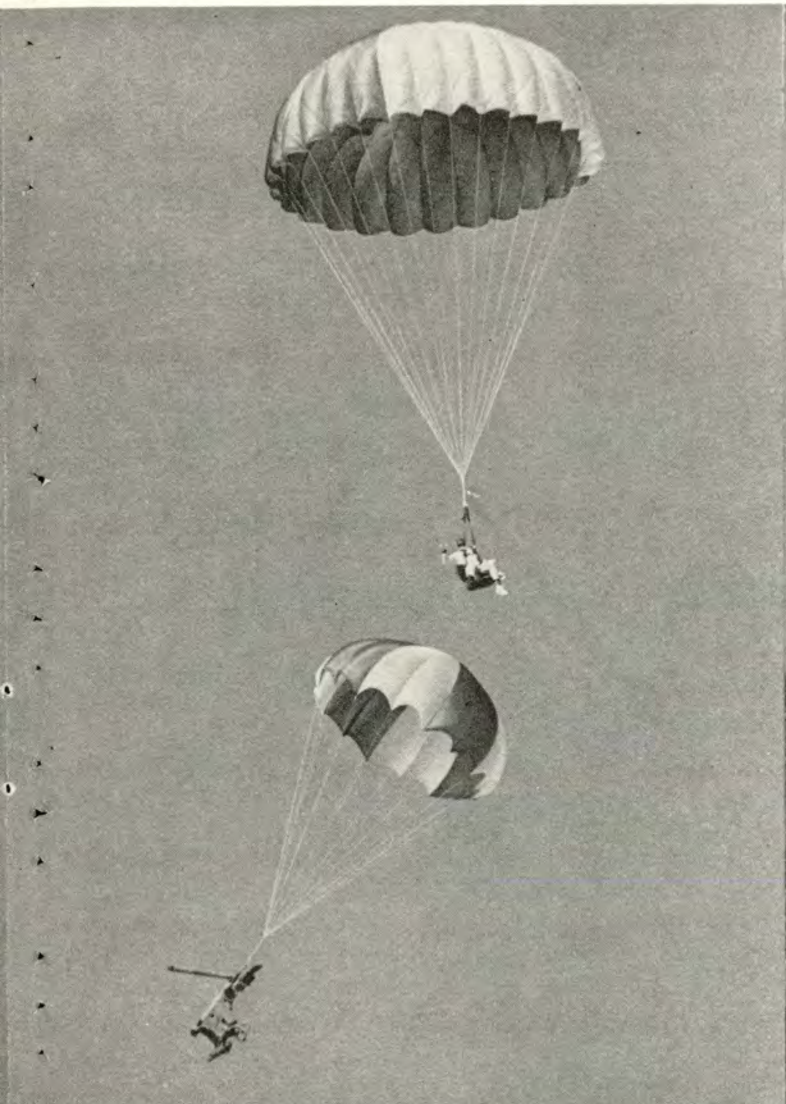
0-0 ZERO ZERO EJECTION



As shown by these photos, a zero altitude, zero speed escape system has been developed. These pictures were taken at San Diego, California, during demonstrations put on by the manufacturer, Weber Aircraft Corporation, for members of the USAF Personal Equipment Advisory Group, Space and Flight Equipment Group and other interested safety personnel. These pictures show one of four ejection seats fired during the demonstration. In this particular sequence, involving an F-102 seat, the rocket seat firing, seat separation, and chute deployment are shown. The seat and mannequin were thrust to a height of approximately 350 feet. After a two-second delay a drogue gun fired, deploying the pilot chute which forcefully withdrew the main chute canopy from the pack. Standard Air Force chutes were used.

The other three firings included an F-101, F-105 (visible in the first picture) and F-106 ejection seat. All were equally successful. The F-106 shot was an official test under existing AF contract. (Weber was awarded the contract to replace the rotational supersonic seat in the F-106 with a conventional upward type seat.) This was the sixteenth consecutive successful static test with this system. The other three shots were conducted to demonstrate the compatibility of the drogue gun deployed parachute concept with other USAF ejection seats.

For demonstration purposes, instrumented dummies were used and a chute for recovery of the seat. The manufacturer states that the G forces imposed are well within human tolerances.



How Could It Happen?

One of the thickest accident files in the safety directorate relates the details of a minor aircraft accident that surely never should have happened. When all the work that has been done to prevent just such an accident as this is considered, the fact that it *did* happen is almost beyond belief. It almost seems this one was predestined, *despite* the efforts of a sizeable number of safety conscious people. We ask you to read on as the pertinent facts are reported, then, if anyone has a suggestion on measures that can be taken to prevent another like accident—short of not flying—let us know; write, care of the Editor.

Before departure from their home station the crew was briefed on the mission in accordance with command directives. This briefing, for the pilot crewmembers, was held in the terminal coffee shop. The navigator and airman crewmembers had attended a formal briefing in the squadron previously. Available for briefing purposes was a flight crew information brochure that warned, among other things, "never make a left hand pattern for __ L or __ R." This guide also identified terrain and other hazards near the base. The three pilots and the návigator went over this brochure a day prior to the mission.

En route, prior to descent, the pilots and the navigator briefed on the approach. The Enroute Supplement, which stipulates right traffic to runway __ and warns of terrain obstacles and lack of lights, was used in this briefing.

Nearing destination an en route descent was requested and received. Control was handed off from Center to Approach. The pilot reports that the radar vector they were given brought them through a saddleback between two peaks and that red lights on the peaks were clearly visible. Because of the apparent height of the peaks the pilot asked Approach as to their height and learned they were more than 1000 feet below his assigned flight level. At about this time Approach asked that the pilot report field in sight. Due to the mountains the field wasn't spotted until the aircraft was in the saddleback. When the field was spotted a turn was made for *left* downwind and the flight path purposely angled to the right due to the closeness of the downwind. At this time, according to the pilot, a gradual descent was also started. When the pilot reported field in sight, Approach cleared the aircraft to tower. Turning base a gear check was requested and made. Final was overshot and turn continued to angle back to line up on final at, according to the pilot's estimate, 30 degrees. At about this time the tower cautioned to be careful of high terrain. Shortly after this the aircraft struck the ground approximately four miles from the runway and less than 400 feet above runway elevation. To better let you re-live the drama, let's tune in on the tape recordings of the communications between Approach, Tower and the Aircraft. (Frequencies, altitudes and aircraft numbers changed or deleted.)

APC: Flight 123, advise when you have Podunk runways in sight.

APC: Flight 123, Podunk runways now 11 o'clock, four miles. Advise when you have them in sight.

APC: Flight 123, do you copy?

123: Roger. I copy—uh—we're debating whether we got 'em in sight now or not.

APC: Very good.

123: Uh Rog-123. We have 'em in sight now.

APC: Roger. Flight 123 cleared for visual approach Runway — Right. Stand by this frequency momentarily.

123: 123

APC: Okay, he's on left base Podunk-uh-two miles off

your - uh - left base-two miles left base now.
TWR: Okay. Let me take a look here.
APC: It's a little hard to see him tonight, eh?
TWR: Yeah we can't—we can't see him yet.
APC: You fellows—
TWR: Will tell you as soon as we see him.
APC: _____ feet, and he's just a mile off the end of your runway now—NE of your runway.
TWR: Okay (pause) okay, got him now. Landing assured . . .
APC: Real fine. Here we go. Flight 123, contact Podunk Tower on 333.3, that's 333.3 immediately.
123: Roger, do you have a VHF please?
APC: Yes sir, 122.2.
123: Roger. Thank you very much.
APC: Roger you bet.
123: Podunk, Flight 123.
TWR: 123, Podunk Tower.
123: Roger. We've got the field in sight, in the process of making some kind of an approach here.
TWR: Roger. Landing runway ___. Have you in sight, report gear down. Wind (given as fifty degrees off runway heading) at six, cleared to land.
123: Uh, Roger, gear is down and locked.
TWR: Roger.
TWR: 123, Podunk Tower.
123: 123, go.
TWR: Roger. Use caution high unlit terrain north northwest of Podunk. Cleared to land.
TWR: 123, I do not have you in sight now. Show landing lights, please.
TWR: 123, Podunk Tower. Do you have the runway in sight?
TWR: Flight 123, Podunk Tower, Do you read?
TWR: Flight 123, Podunk Tower, Do you read:
TWR: Flight 123, Podunk Tower on guard. Do you read?
TWR: Flight 123, Podunk Tower. If you read, blink your lights, please.
TWR: Flight 123, Podunk Tower on guard. If you read you can make a right turn now, get on a right downwind landing ___, runway ___, winds calm, cleared to land.
TWR: Flight 123, Podunk Tower on VHF, do you read?
123: Ah, roger. I am reading you now, uh, we had—hit some terrain out there and we are getting uh—O.K.—we're getting a safe indication on the gear now and we will be coming in—around for another approach.
TWR: Roger 123, I understand. Enter on a right downwind for runway _____.

Investigation and analysis disclosed that:

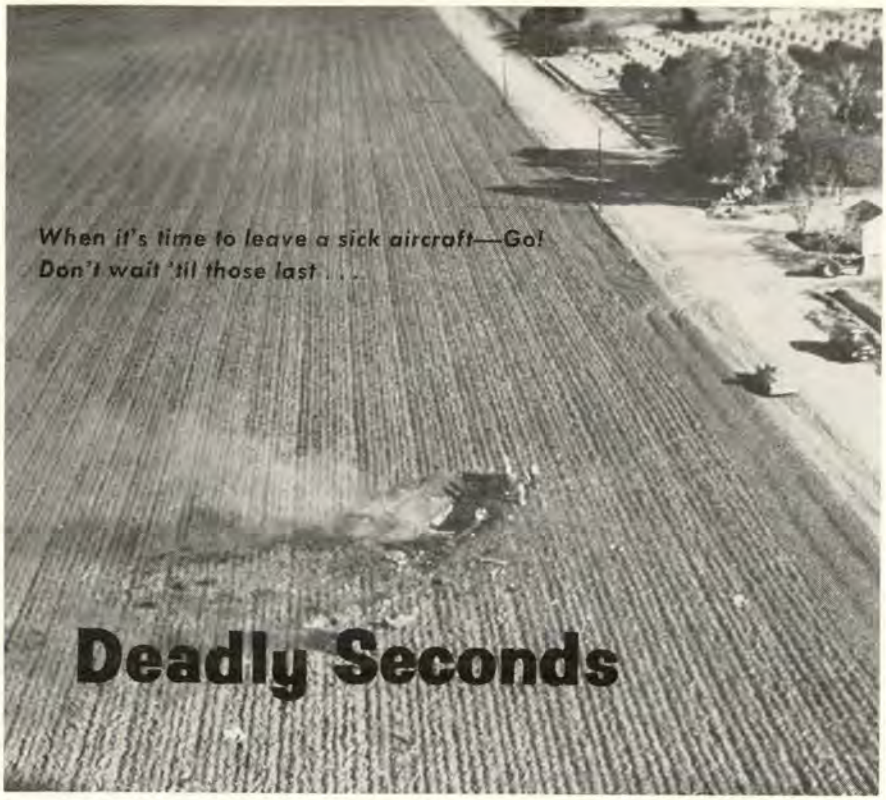
Weather was clear and not a factor. All crewmembers were in good health. Physical exams were current and no waivers were or should have been in effect. Crew rest was not a factor. The pilot and copilot used oxygen for 15 minutes during the last hour prior to landing. All personal equipment used functioned properly.

There was no evidence or indication that maintenance error, component malfunction or materiel deficiency was a contributing factor in the accident.

Training records showed that all crewmembers were current and qualified.

Remembering the briefiings, the brochure, the Enroute Supplement and the transmissions concerning the terrain, we come back to the original question: HOW COULD IT HAPPEN? ☆

The strange scrape marks across barren ground and a gully were made by the tires on an Air Force aircraft during a VFR approach on a clear night. More evidence in the picture on the right, a pair of main gear wheels and tires knocked off during the desert touch and go.



Deadly Seconds

"I'M BAILING OUT!"

Later it was found that the pilot went in with the aircraft. Apparently he made no attempt to get out.

The above does not describe a frequent occurrence, but it happens often enough to cause serious concern. Why do pilots fail to get out of doomed aircraft when they know they are going to crash? Seldom can the reason be stated with surety. Only guesses can be made—educated guesses, perhaps, but they are still guesses. Did he delay too long? Did he think he could get the aircraft under control in time? Did the ejection mechanism fail?

Before jets and ejection devices, pilots were expected to try to save the aircraft. Today things are different; the man in the cockpit is not asked to risk his life by trying to put a sick jet fighter on the ground. There is no stigma to getting out while the getting is good. With the increased reliance on thrust in jets, their critical glide angle and loss of power boosted controls when the engine fails, it just makes sense to save the crew first, the aircraft only if it's virtually a sure thing. The number of ejections we have is evidence that Air Force pilots have been well indoctrinated with this point of view.

But there is another facet of this problem. It has been covered before but in light of recent experience deserves reiteration. This is the case of the pilot who recognizes that he is in trouble and apparently intends to get out while he can but who delays too long. An example is provided by a student who announced that he was in a spin and that he was bailing out. Immediately after this transmission the aircraft was observed by another pilot who estimated its altitude as 10,000 feet. About eight seconds later (11 seconds prior to the crash), the student transmitted that he was in an inverted spin. The mike remained keyed until a second or two prior to impact; apparently there was no attempt to eject.

Between the pilot's last call and impact Mobile directed him to bail out. In fact, this order was repeated several times but with the mike keyed the pilot would not have heard these transmissions.

Apparently this accident was caused by spatial disorientation on the part of the pilot. Witnesses stated they were able to see the aircraft lights and follow them almost to the point of impact. They did not think that the plane was in a spin. That the aircraft probably was not spinning was indicated by the velocity with which it hit the ground—estimated as being more than 400 knots.

The tragedy here is that this pilot had plenty of time to eject safely. If he had left the aircraft immediately after his first call he would have had more than enough time. If he had got out right after his second call he probably would have made it, although it would have been marginal. To have delayed past that point surely would have been fatal.

Reconstructing, with some simple arithmetic, we find that assuming 400 knots speed he would have been traveling at about 675 feet per second. We don't know his exact rate of descent because we don't know for sure the attitude of the aircraft. By fudging a little, we will say that he was descending at 675 ft./sec. This would place him at 12,825 feet 19 seconds prior to impact. When he made his second call eight seconds later he would have been at 7,425 feet, more than 2500 feet below Dash-One recommended minimum altitude for ejection from a T-33 out of control.

The possibility that he could have safely ejected at about 7500 feet does not negate the advice in the handbook. The fact that this pilot probably was spatially disoriented very likely influenced his decision on ejection. He thought he was in a spin and probably didn't realize how fast he was descending. This indicates that he was relying on outside references and not on his instruments. Whether the aircraft was uncontrollable or not is beside the point. He THOUGHT the aircraft was in an inverted spin. To him it was out of control. He should have punched out not later than 10,000 feet.

We realize that this is Monday morning quarterbacking. But if this reinforces all of the other material on this subject and in any way helps prevent such fatal accidents as this one, then Monday morning or any other kind of quarterbacking, is worthwhile. ☆

Guns Don't Kill ...People Do

The fact that Air Force personnel continue to kill each other and themselves in accidental shootings indicates there is a need for education in the proper respect, care and handling of firearms. You will note that the term "respect" is listed before "care and handling," for without respect even a knowledgeable person can wind up on the wrong end of a discharged firearm.

Guns don't kill people. People kill people. And they do it with all manner and means of implements. Killing others and themselves by the use of an automobile has reached a magnitude whereby the ground safety people are able to predict (with a minimum of variance) just what time of day the next auto accident will occur, what the age and rank of the driver will be and how far from the base it will happen. It is not so easy to predict just who will practice the "quick draw" and end up a cripple for life; or who will become excited during the opening day of pheasant season and blow his hunting partner in two, or who will trip while carrying a loaded rifle with the safety off, shoot himself and bleed to death just a few yards from a highway. These accidents don't just happen. They are caused. The tragic part is that by being caused, they can be prevented, but are not.

An accident occurred when an Air Policeman determined (erroneously) that because of a broken disconnector spring in his .30 cal. carbine, it would not fire because the firing pin would not function. He had tried to pull the trigger several times (with the weapon unloaded) and it would not "click." To impress his fellow Air Policemen, he inserted a live round into the carbine, placed the muzzle under his chin and squeezed the trigger. Surgery saved his life, but necessitated the removal of an eye and the left half of his brain.

Several airmen were on a hunting trip and were staying in a remote cabin. One of the party decided to shoot through the doorway at a barrel. Others followed, even though the light was not good. Sometime during a lull in the shooting, one man went outside. He was shot through the head when his companions resumed their "target practice."

These happenings are not just gory stories to emphasize a point. They are typical of the events associated with the 36 deaths and 510 accidents which occurred during the last 32 months involving firearms. All resulted from unthinking acts of individuals wearing the same uniform as you.

How can you tell who this individual is? You can't. But watch out for the guy who clears his automatic by first working the slide (ejecting one round) then takes the magazine out and says it's safe. Look for the guy who has a pistol hidden in his locker in the barracks and shows everyone how smart he is not having to store it with the Provost Marshal. And notice the guy on the firing range who gets a jam or miss fire, and drags the muzzle right through your head while trying to open the receiver. He could be the one who "just forgets." I've seen a top three grader, who was pulling security duty, try to swing out the cylinder of a .38 special service revolver by first pulling the hammer to the full cocked position. I dont know if he got the cylinder open, I didn't stick around.

If accidents involving firearms are not predictable, then what can be done toward their elimination? To begin with, the general principles of gun safety should be drilled into every person in the Air Force. Commanders should insure that personal firearms are stored securely, yet available to the owner for off-duty use. Owners should be required to demonstrate the proper care and handling of firearms. Air Police should receive a continuing course of instruction (as evidenced by their frequent involvement in shooting accidents) because of the greater exposure and use. The list could go on and on; each commander should tailor his requirements to the situation. Obviously, the personnel of the USAF Marksmanship Team don't require as much supervision as a new group of AB's.

Gunshot wounds can be very painful and permanent. Often there is no second chance. Movie and TV actors get up and walk away when the shooting's finished. In real life, they often lay there until the coroner arrives.

Don't kill your friends — or yourself!

PRINCIPLES OF GUN SAFETY

- Treat every gun as if it were loaded.
- Always point the muzzle in a safe direction.
- Be sure of your target.
- Keep your finger out of the trigger guard until ready to fire!
- Practice self control.
- Open the action and unload any gun not in use.
- Store guns in a safe place.
- Be sure the gun and ammunition are in good condition.
- Sight-in guns before using.
- Learn to be a good shot.
- Insist that your companions observe these same rules.

A Winter Pattern

The early Florida sun began to make its presence known through the back of Joe Collins' jacket as he walked across the ramp to where AF 57246 was parked. He looked at Gene Murphy, walking beside him, and said, "That sun feels good at this hour. Bet we'll really appreciate it by the time we get back."

"Rog," Murph replied, when he had finished his yawn.

"What's the matter—not much sleep last night?"

"Naw. Fran had planned these two tables of bridge. Couldn't change at that late date. The last couple didn't leave until three. Everybody else gets Saturday off, you know."

"I could probably have got somebody else."

"No sweat. I need the time. Haven't had a good cross-country in a long time. K.C. used to be a great town. I'll try and catch a few winks on the way."

Joe made the next comment to himself. "Hope the autopilot works." He hadn't turned in very early himself. Today was his anniversary and, since he wouldn't be home, they'd gone out for dinner and a show. Years ago, when he'd had a cockpit job, he would be gone half the time and his wife understood. But now she didn't understand, when he hadn't flown at all for 42 days, why he had to be gone on their anniversary.

At the plane he said to Murph, "You want to make the walk-around—I'll do the inside."

"Rog." Murphy threw his bag in the door and started around the tail. Joe tossed his bag in, climbed the short steps and made his way up the sloping aisle of the C-47. All the seats had been pulled out along the left side and cargo was lashed in place. He pulled on a couple of the tiedowns as he went forward. He hunted around until he located the 781, noted that the bird was on a red diagonal and checked airframe and engine time. The right engine had 1426 hours, the left 154. He liked them at 600 hours—then they were broken in and should have a lot of good time left. He checked the writeups. There were two successive writeups, "Oil leak Nr 2." Corrective action was shown after both. In each cause it concluded with "Grd checks OK." Joe shrugged and signed the form. He picked up the checklist and began leafing through it.

"Ready?" Murphy had come up behind him.

"Yeah, here, you call the checklist and we'll get fired up. Alert show up?"

"Rog."

Joe worked his way into the left seat. It was at times like this that he would momentarily vow to start the 5BX program. There wasn't much clearance between his belly and the wheel.

Joe and Murph both did some fumbling getting the machinery running. Like Murph said, "Every one's configured different." Neither attributed their not having flown for over a month to the reason for their unfamiliarity.

Murph copied the first half of the clearance, then the second half after he made the partial readback and explained, "You faded, tower."

"Air Force 57246, your right engine is smoking pretty bad," tower reported.

"Rog," Joe said. He looked at Murph. "Probably loaded up."

Murph nodded.

Finally, between the two of them, the checklist and the reliability built into the Douglas Racer they were airborne and slowly grinding toward the north and niner thousand.

"Cargo must be pretty heavy," Murph surmised when, fifteen minutes after takeoff they climbed through 3500.

"Yeah," Joe agreed. He looked at the rate of climb which now held steady at just under 200 feet per minute. For the first time his scan began to take in the engine instruments. "Hey," He said, pointing at the cylinder head gages, "look at those low cylinder head temps: 'ja ever go to trail."

"Sure didn't," Murph replied, surprised, and turned the controls below the copilot's window to trail. This helped, and when Joe pushed the throttles forward to re-establish climb manifold the rate of climb increased to 500 feet.

That's the kind of trip it was going to be. The lieutenant who had run out at the last minute to catch a ride had been watching from behind the seats. He shook his head, went back, sat down, checked the safety belt, said, "I hope it stays VFR" and fingered his rosary.

The crew discovered the oil leak north of Muscle Shoals. They discovered it when the lieutenant came up and said he'd been watching that oil leak on Number 2 and it was definitely getting worse.

Joe woke Murph and sent him back to check. Murph said the lieutenant was right, it was worse. Joe noted that the oil pressure was a bit high on Nr 2. He pulled the throttle back part way and pushed the mixture forward.

"Better land at Memphis and get it checked," he said.

"I'd sure like to make K.C. Maybe we could just keep an eye on it," Murph suggested.

Joe went back. Black oil was seeping out through the nacelle, spreading out along the flap and rippling in the slipstream. When he came back he said, "We'll land at Memphis — got that front to go through to K.C. Call Center and

"Sure a helluva change from Florida," Murph commented, adding three-fourths throttle to plow through snow on the ramp.

cancel."

Late that afternoon, standing on the ramp, Murph said, "Hard to believe how much colder it is in Memphis in January. Coffee?"

Joe checked to make sure the zipper was all the way up on his summer flight jacket. "Might as well," he said.

They finally got off. Actually, maintenance hadn't done so much work; it was just that it was Saturday and they were shorthanded. When they did get around to 57246 they tightened some rocker box covers, checked the oil lines, washed Nr 2 and made a runup. Seemed O.K.

It was dusk when the intermittent flashes of the rotating beacon marked their climbout across the Mississippi. They had the heater up all the way, but it was still cold in the cockpit. Wisps of clouds began to drift across the wings, then they were into the front. Murphy was in the left seat and he flew almost entirely by reference to his attitude indicator. He tried to approximate within 500 feet of assigned altitude as the Goon wallowed and pitched. Joe frequently used his flashlight to observe the snowflakes that swept against the windshield then exploded into nothing. He'd be glad to get there. Whoof! The bottom dropped out, then the old Goon cracked as descent stopped abruptly. Joe took a hitch in his seat belt and tried to lick some of the dryness out of his mouth.

They took turns fighting through the front. The turbulence was supposed to ease up over Flippin. They were making 90 knots ground speed. Neither noted much improvement when the needle finally swung.

"One good thing about its being so cold," Joe commented during a brief lull in the turbulence, "We shouldn't pick up any ice."

At Springfield they began to be in and out of clouds. Center gave them a descent at Holden intersection. They were down to two thousand at Blue Springs. Thanks to radar vectors they got lined up for final at Fairfax. They frowned at each other, then both leaned forward to peer through the windshield when tower advised, "There is a dyke at the end of the runway, the runway has patches of snow and ice and snow has been piled on the sides of the runway."

They made it; Murph flying and Joe keeping up a running advisory. "Sure a helluva change from Florida," Murph commented, adding three-fourths throttle to plow through snow on the ramp.

Just before shutdown Joe remembered. He asked the tower, "What is the anticipated low temp for tonight?"

"Minus four."

"Gad!" Murph said.

"Murph," Joe directed, "See if you can find a Dash One someplace. We're going to have to dilute this dog." The Dash One wasn't readily available so they settled on three minutes. Neither thought to exercise the props.

The high point of the day was just before 11 p.m. They had obtained a room at the Muehlbach and Joe was in a hot shower when Murph came in with a bottle and offered, "How about a shot of rye?" Joe didn't care for rye, usually. This tasted extra good!

They were at the field at eight o'clock, shivering through the preflight. Each wore pajamas, flying suit, summer flight jacket and gloves without the liners. A 15-knot wind was blowing and theirs was one of the shortest preflights on record. They took a quick look in the Nr 2 wheel well. Quite a bit of oil, but Murph said, "Looks like it'll last 'til we get back to Florida. Besides, it's only a short hop to Lincoln."

They climbed in, kicking the snow from their oxfords. Part of the cargo had been unloaded. The remainder had to be delivered to Lincoln, Nebraska, not later than noon.

The wind was gusting to 28 knots at Lincoln, the temperature seven. This, Joe and Murph agreed when they and a gust made it through the door of base ops at the same time, was the coldest, most miserable weather they had ever seen. And the sheepskin clad locals who had watched their sprint across the ramp hadn't done anything for their morale either.

Never had either filed faster. They had the paperwork ready, watched from behind a frosted window, and dashed out the door as soon as they saw the truck pull away from their bird.

"Ya got an oil leak on Nr 2," an alert crewman reported, as they clambered aboard.

"Yeah, we know," Joe said. They weren't about to stay.

"One good thing," Joe said, as Murph taxied out, "this cold and this much wind—no snow should stick to the wings or control surfaces."

The Goon and the center of the cold front renewed acquaintances over Memphis. Here, at the worst possible moment for the two shivering pilots whose main concern was to head southeast and hope, they lost Nr 2. It had been warning people for the last 30 hours. No one had really taken the warnings seriously. Clearing out the sludge with the dilution at

Fairfax had really increased its appetite for oil. Recognition came gradually. Old 57246 began to want to turn to the right. Joe and Murph also noticed a strange difference in the turbulence. Oil temp on Nr 2 was above the red line. Pressure was low. Reducing power on Nr 2 cut down on the vibrations. Joe watched the Nr 2 nacelle as he worked the throttle back and forth. Man, it was really rough.

He declared an emergency and asked for Memphis weather. Four hundred and one. Intermittently 100 and one-fourth in heavy snow showers.

"Wish we'd checked it at Lincoln — probably should've added oil," Joe said.

They got radar to guide them toward the field. Joe kept reducing power. Finally, when we saw smoke around the cowling, he said, "Got to feather, Murph. No power left and I'm afraid we'll get a fire if we try to keep it running."

"A 15-knot wind was blowing and theirs was one of the shortest preflights on record."

Joe pulled the throttle back and cut the mixture. The plane swerved right and Murph, in a panic reaction, reached up and punched *Nr 1*. Joe saw what happened — screamed "NO!" too late — knocked Murph's hand away and pulled out on the button. There was a sickening drop in sound, speed and altitude, then a high pitched whine as Nr 1 came out of feather and over sped. The airload on the prop brought it back within limits before either pilot could take any action. Joe pushed RPM and Nr 1 throttle up to max power. They had lost 1500 feet. He reached up and pushed the feathering button for Nr 2 and RPM dropped to 1600 and stopped. "It won't feather," Murph yelled. "Radar, we've lost Nr 2. It won't feather all the way. Request you expedite—close in pattern for the nearest suitable field."

"Roger Air Force 57246. Turn right zero one zero, pattern correction. Maintain two thousand."

"We're one thousand four hundred. Unable to climb."

"Roger. Understand. Turn farther right zero two zero."

Another vibration, different yet, shook the Goon and Joe pushed the yoke forward. "You're stalling it," he cried.

"No I'm not. Look at the airspeed. One hundred ten knots."

Joe wiped his side window, looked out, then hit the deicer boot control. "We're icing up down here," he yelled.

The airspeed went to one twenty, the altitude to 1100. The stall buffet ceased. Joe picked up the mike and said, "Better hurry with that GCA. We're icing up. Eleven hundred now." He pushed hard against the full forward throttle. He looked out at Nr 2 prop and pushed in Nr 2 feathering button.

"Got a letdown plate?" Murph asked.

"No time. Fly their vectors." He picked up the mike again. "Radar, we won't be able to climb out for a go-around on one engine with this load of ice. Gotta make it first time."

"Roger, understand. Now turn right to zero two five."

"Rog, what's the current weather?"

"Stand by."

The altimeter read eight hundred. Murph eased forward to eliminate the slight buffet. Seven hundred.

"GCA, we're losing altitude out here. Six fifty. Just give us a straight in to the closest runway."

"You get the gear," Murph yelled across the cockpit.

"When I see the runway," Joe replied. "Hang onto every inch of altitude you can."

"Can't see," Murph called. He was peering into the windshield. "Iced over."

"Fly instruments," Joe yelled, "I'll watch for you." He slammed his side window open and tried to see out. He started to say something into the mike then dropped it.

This turbulence was different. It started way out on the right side and the plane shuddered in its violence. It was caused by the right wing striking the tops of a row of trees. The nose pitched down and the plane swung viciously to the right, whipped around as though in the hand of a giant.

Realization came in that fraction of time before oblivion. Murph stood braced on his left foot, holding the controls full back and left. Joe thought of cutting the switches, but there was not time for muscular reaction. The mouth piece of the microphone swung forward against the panel and the plastic shattered when the nose crumpled against a tree.

"Air Force 57246, Navy Memphis Radar, over."

"Air Force 57246, Navy Memphis Radar, over."

The GCA operator continued to look at the spot on his scope where the target blip had disappeared. The steady hum of his equipment was the only sound.

His right hand reached out and picked the red phone off its cradle. ☆

Major T. J. Slaybaugh

MISSILANEA

THIS SIDE UP.—The "fits and convulsions" experienced when water sneaks down your wind pipe is not confined to people. A similar reaction occurs to mechanical equipment if normal precautions are not practiced. The compressor assembly which pressurizes the freon in the chiller assembly of the Minuteman G & C liquid cooling system is a good example.

The compressor assembly is a factory sealed unit using a special refrigerant type of lubricating oil. The lower portion of the unit serves as a crankcase for the oil while the upper portion serves as a chamber into which the freon return line from the evaporator is dumped. The upper chamber provides a reservoir of freon gas for the piston-type compressor. The freon is sucked from the upper chamber into the piston compressor through two upright "snorkel" tubes.

Everything works well as long as the equipment is level; but, extreme tilting of the compressor assembly or the complete chiller assembly can result in the oil spilling into the piston compressor via the two tubes. The presence of liquid oil in the compressor's gas lines produces a "hydraulicking" action on the compressor discharge valve assembly that contributes to compressor failures.

The initial packaging of compressor assemblies and chiller assemblies from the manufacturer prominently notes "This Side Up." The apparent ruggedness of the compressor assembly tends to defy cautious handling and it is fairly easy, whether marked or not, to tilt excessively in handling; however, the penalty for not maintaining the compressor upright is a reduction in Minuteman reliability. Tipping of the compressor about 40 degrees from its normal position or jarring it to cause sloshing of the oil greatly increases the probability for subsequent "hydraulicking."

In the above illustration, the compressor assembly was the object of the story "This Side Up"; but it is equally applicable to other items of equipment which require special handling.

Minuteman Service News
Boeing Aero-Space Division

OUT OF THE LOOKING GLASS

TV MONITORING OF MISSILE COUNTDOWN—The countdown had been initiated for a LOX only exercise and, although everything appeared normal on the Launch Control Console, no indications of LOX flow could be seen on the TV receiver monitoring the Stage II LOX probe. A vague feeling of uncertainty began to grip some of the observers. The Missile Combat Crew Commander (MCCC) turned to the Site Commander seated behind him, but having already noted the problem, he was hastily departing the control center with the comment thrown over his shoulder to continue the count.

The countdown, amid much silence, was continued for a few moments until the spell was broken by the Site Commander's voice coming over the communications network, advising the MCCC that LOX was flowing into Stage II.

It was found that the Stage II TV camera was focused on the wrong missile; but, of equal interest is how the Site Commander *knew* LOX was flowing to Stage II if he didn't in fact observe it from within the silo or from the tunnel entrance. And, if this were true, how did he get there during this hazardous activity—and *who* accompanied him?

HIGH WINDS — An early Re-entry Vehicle (R/V) mating had been tentatively scheduled for a distant missile site, with the realization that it might have to be cancelled because of forecast high winds A check with the duty forecaster prior to departure of the R/V mating team revealed that the forecast had not changed and that the winds would probably reach 35 to 40 mph before the scheduled R/V mating time and hold until after dark. Nevertheless, the Maintenance Control Officer elected to dispatch the mating team, hoping the forecast would be wrong. Upon arriving at the missile site, the NCOIC found the winds were high, and called the Missile Squadron Job Control for guidance.

The Base Weather Forecaster remained firm in his forecast; therefore, a call was made to a weather bureau forecaster located more than 50 miles farther from the site than the base. The forecast for the area in which he was located called for winds within the safe range for R/V mating. This information was then used in directing the R/V mating team to go ahead as scheduled. Fortunately, at this time, the Commander became aware of the situation and placed a hold on the operation until an accurate on-the-spot check could be made, using portable wind measuring equipment. The check revealed that the wind exceeded the safe limits, whereupon the Commander directed postponement of the mating.

"O wad some pow'r the giftie gie us

To see oursels as others see us!

Rob't Burns."

Major K. H. Hinchman
Directorate of Aerospace Safety

Readers are invited to contribute their experiences to this "Out of the Looking Glass" feature. (Ed.)

DOWN AND OUT...

George W. Williford, OOAMA, Hill AFB, Utah

Since February, 1962, there have been four reported instances where the B-52 navigator's emergency escape hatch has been accidentally jettisoned during flight. In three of these mishaps crewmembers have been "blown" out of the aircraft, with two fatalities.

The 1962 accident occurred over the North Atlantic at 31,000 feet. The aircraft commander had joined in a search for a malfunctioning radar component and apparently caught his shoe or flight suit under the emergency hatch manual release handle. When depressurization occurred, he fell from the aircraft and his body was never recovered. Unit and command corrective action included warning all crews of the hazard associated with the inadvertent operation of the handle during flight and adding a warning note to mission briefings concerning this hazard. A UR was submitted to require the development and installation of a suitable guard to prevent accidental operation, or the relocation of the handle to a less vulnerable position. Action was initiated to require "Warning" notes to be inserted in the handbooks.

Another accidental hatch jettisoning occurred in March, 1963. In this instance, the radar navigator was sitting on one side of the hatch, with his feet across the hatch. The aircraft was flying at 39,000 feet and somehow the emergency jettison handle was raised. Fortunately, the radar navigator was wearing a chute, and, though he was blown from the aircraft, he survived with only a fractured arm and ankle. The bomb wing was directed by the air division to re-submit the UR concerning the placement of a guard over the handle. The wing was also directed to emphasize the hazards of this system at crew briefings.

Fortunately no crewman was blown out in the third mishap (which occurred in October, 1963). It was assumed that the hatch lever was actuated by an unknown foreign object. Corrective action included briefing all personnel on the danger involved, and a request to quality control to check on a positive lock or cover to prevent recurrence.

Before the third accident, TO 1B-52-1593, 24 July 1963, was published. This TO concerned the installation of a safety guard over the radar-navigator's emergency hatch release handle. Change TO 1B-52-1593C, same subject, was published 12 February 1964. Both of these TO's were to be accomplished at wing-base level.

The last accident occurred in June, 1964. Unfortunately these two TO's were on the list of "TO's not complied with" for this aircraft. At 33,000 feet the navigator requested permission to leave his seat to get a drink of water. Thirty to sixty seconds after he left his seat, the hatch was jettisoned, and the navigator, without a parachute, was blown from the aircraft. Cause: Inadvertent operation of the emergency jettison handle! Corrective action in this case included all wing aircraft on the station having TO 1B-52-1593 and TO 1B-52-1593C complied with by the day following the accident. This is an example of "locking the barn after the horse is stolen."

This problem has been with us since the first accident, February, 1962. The score: four mishaps, three people blown out of aircraft, with two fatalities, all occurring in two years and five months. We all hope this problem has now been permanently cured by thorough education of all crewmembers of the hazards associated with inadvertent activation of this lever and a fix to prevent possible recurrence. ☆

Aerobits

SID Violations—Pilots have been violating Federal Aviation Regulations by not adhering to their SID instructions. Six such violations occurred in the past year and each involved failure to adhere to altitude restrictions when crossing intersections. SID's are displayed in nice little booklets, plain and simple. They are usually in pictorial and narrative form. They depict departure routes and altitude limits and crossing fixes. They are a means for simplifying departures. Then why are there violations?

Basically the violations occurred as a result of the pilots' misinterpreting the altitude instructions received as part of the clearance that is not contained in the SID. Example: ATC clears AF 12345 to ADW AFB via . . ., Plum 6 departure Gettysburg transition maintain FL 250. The FL 250 applies only to that portion of the route following completion of the procedures contained in the SID. It does not supersede the printed altitude restriction. The pilots who were charged with a violation had assumed that the phrase, "maintain FL . . . , " authorized them to deviate from the printed altitudes. The point is to be sure to adhere to the SID altitude procedure when cleared via the SID and, after that, apply the additional instructions concerning altitude cited in the clearance.

In essence, when flying a SID the safest thing to do is to follow the printed instructions verbatim. If for any reason doubt exists, request clarification.

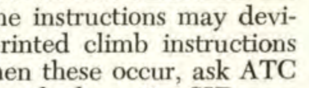
Occasionally, Air Traffic Control will provide radar vectors that differ from the SID route or the instructions may deviate from the printed climb instructions of the SID. When these occur, ask ATC if this action cancels the entire SID.

Harrie D. Riley
Directorate of Aerospace Safety

PAPER CUTTER. When the pilot arrived at the F-102, he noticed the aircraft forms and the ladder lying on the ramp beside the aircraft. Being the thorough type, he checked the forms, placed them back on the ground and proceeded with his walkaround with the transient maintenance crew chief. When they finished the pilot found the ladder in place against the aircraft so he climbed into the cockpit and fired up.

The first sign that all was not as it should be came when a couple of mild compressor stalls occurred as the RPM passed through 80 per cent. However the instruments gave normal indications and the pilot taxied out for takeoff. After the afterburner was lit, the wingman noticed an abnormal flame pattern coming from the tail pipe and notified Lead who aborted and taxied back to the ramp. Inspection of the engine revealed FOD necessitating an engine change. Sure enough, the engine had gobbled up the aircraft forms.

Apparently what happened was that the airman who placed the ladder against the aircraft put the forms in the boundary layer duct. The fact that there were four maintenance men around the aircraft, all attempting to aid the pilot, caused some distraction, possibly some duplication of tasks and deletion of others. The facts that this was a strange base and that the pilot did not know the maintenance men may have contributed to the confusion.



F-100 AIRSPEED INDICATOR—On takeoff, the pilot noted that the line speed was 10 to 15 knots higher than computed. Remainder of flight was normal until the aircraft was in the pattern at destination; there the pilot found the aircraft hard to maneuver and that there was a higher than normal sink rate. Full power was applied but the aircraft hit short of the overrun and the pilot took the aircraft around. He made a successful landing on the second try and attributed the high sink rate to a strong crosswind.

When approach was made on the return to home base, again sink rate was unusually high and full military power was necessary to complete the landing. On reaching the ramp, the pilot had the airspeed indicator checked. At 180 knots, the indicator was 30 knots high. Consequently, on final approach the aircraft was actually flying at 150 knots with an indicated airspeed of 180.

The base that reported this incident recomends pilots be critical of:

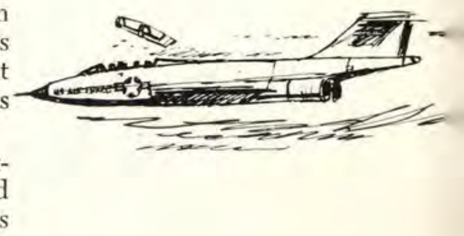
- Line speed computation and check.
- Aircraft that doesn't maneuver properly for IAS.
- Higher than normal angle of attack and power setting for IAS.

DEADLY MISUNDERSTANDING. A recent fatal accident might have been prevented had a pilot not given a "Roger" to a transmission that he did not understand. It is true that the tower warning of conflicting traffic was given using non-standard phraseology. However, a "rogered" transmission is an *understood* transmission and can pass responsibility from one agency to another. In this case a pilot on go-around was advised, on downwind, that he was No. 2, following same type two miles. He "rogered" but misunderstood the instruction, still thinking he was "cleared No. 1" as he had been originally. He continued his approach. Investigators surmised that the pilot of the authorized No. 1 aircraft, on GCA final at night, suddenly found his cockpit flooded with landing lights and shoved forward to avoid a midair. His aircraft struck the ground and was destroyed.

Maj Philip O'Brien
Directorate of Aerospace Safety

F-101 SMOKE, FUMES, BLOWN CANOPY. During taxi for takeoff the equipment cooling out light illuminated. The switch was recycled once but the light stayed on. Radar was turned off and taxi continued. The mission was chase for initial solo and radar would not be required. Both engines were run to full military power for a thrust check and no problems were encountered. Takeoff was a normal burner takeoff with no problems until airborne. As the gear was retracting heavy smoke entered the cockpit. The cabin pressure switch was placed in ram position and the mission aborted. An emergency was declared due to smoke and fumes in the cockpit. These were extremely strong in the rear cockpit and not noticeable in the front cockpit after the cabin pressure switch was in ram position. The aircraft was flown at 320 knots to an eight mile final. As turn to final was being made the canopy blew. The tower was notified that the canopy had blown and that a landing would be accomplished from a straight in approach. The pilot in the rear seat experienced moderate buffeting, however he had no difficulty in movement. He was unable to hear the IP in the front seat at speeds above 240 knots due to the wind blast. Vision was not affected. A heavyweight landing was accomplished successfully.

A clamp on a hot air line in compartment 206L had separated and allowed air to escape into the nose section. This air scorched and melted insulation on wiring and was hot enough to cause the M-3A external canopy initiator to fire and blow the canopy.



Aerobits

COLD WEATHER, ORIT MITO LAUNCHES AND IG'S. The changes in Operational Readiness Inspection Test (ORIT) requirements and the coming of cold weather again make it imperative that all flight supervisory personnel, the commanders, and the Inspector General team chief, carefully weigh the effects of extremely low temperatures on the B-58 aircraft systems. It is fairly safe to assume that sufficient time will be available between engine start and beginning takeoff roll for the engine oil to warm up enough to provide stabilized AC electric power and reliable engine operation; however, the hydraulic fluid required to safely operate the flight controls may not have had time to reach a safe operating viscosity. The Flight Manual has a good discussion on pages 9-14 on the symptoms and effects of inadequately warmed hydraulic system (and flight control system) fluid. Responsible personnel must insure adequate system warmup time required for safe operation during sub-zero ORIT Minimum Internal Takeoff (MITO) launches.

LtCol I. D. Rothwell
Directorate of Aerospace Safety

MM-4 ERRORS AGAIN. As a result of another report of erroneous attitude indications on the pilot's MM-4 attitude indicator in a KC-135 we have again been asked to remind pilots of this insidious hazard. Though the "OFF" flag will appear with loss of electrical power, there is no "OFF" flag indication due to MM-4 attitude gyro internal failure. Constant attention of both pilots is essential for safe operation.

For more detail on this problem we recommend rereading "Watch Your Attitude," AEROSPACE SAFEAL, October 1963, page 9.

NEAR MISSES continue to occur in Oil Burner areas. During re-entry to the low level portion of flight the copilot of a B-52 flying at 3500 feet spotted what he described as a medium to large jet about 200 feet away at 3 o'clock. The other aircraft was at the B-52's altitude on a course of about 10 degrees. The heading of the bomber was 355 degrees.

The copilot could not identify the other aircraft so it is not known whether it was military or civilian. Regardless, Oil Burner routes are adequately published. Plan to avoid these areas at the times and altitudes indicated. ☆

FALLOUT continued

ing the bird. (Note I have omitted such other distractions as finding the flashlight or turning up the friendly red lights so I can read.)

Now let's assume we're within 20 miles of the holding fix and you vaguely recall procedures outlined in the AF Manual prescribing the most current accepted method of entering a holding pattern which stated, "If you arrive at the approach fix on a heading within 70 degrees of the published inbound course on the maneuvering side, turn outbound on the maneuvering side to parallel the reciprocal of the inbound course." (I don't want you to think I memorized the above quote so I'll be perfectly frank and tell you now that I copied directly from AFM 51-37.) Now we're using another terminology and thereby further complicating the old Jock's thought process while he is frantically trying to form a mental picture of what the maneuver he is doing in the air is supposed to look like on the ground. I assure you he will get into the holding pattern, but he will use up valuable seconds or maybe minutes in the process. And it just ain't necessary in the first place.

Had this gent told me to proceed on a heading of 247 degrees to a 20 mile DME reading, or an intersection of a well known VOR, the adrenalin would have remained in place, no violent maneuvers would have occurred and the purpose would have been adequately served. Meantime, back at the ranch, Joe, the unbiased controller, drinking his coffee and munching a sandwich, working from a 20-inch scope with protractors, computers and other tools of the trade lying nearby on a good flat surface, doesn't encounter all these problems.

I know all about radials emanating outward from a center point — and that we had to come up with some common denominator that all people in the flying racket understand and all the rest of that jazz, but why, for Pete's sake, did we have to put the monkey on the jock's back and make him go through all these mental gymnastics when the guy on the ground, in a very normal environment and with all kinds of radar available, could do it just as well and much safer?

The fact that we have been following these procedures for 10 years doesn't mean they can't be changed. We're really in the midst of a navigational renaissance and many changes are in the making. If you have strong feelings on the subject one way or the other, let me know. I've got a few friends left in the business and you'd be surprised what might come out of the whole thing.

Col. James G. Fussell
Directorate of Aerospace Safety

WELL DONE

A1C RONALD G. BROWNING
Flight Engineer

Captain DOYLE J. TAYLOR
Pilot

Major EARLE P. NASE
Instructor Pilot

1001 AIR BASE WING, ANDREWS AFB, WASHINGTON, D.C.

On a VT-29B orientation flight, Captain Taylor prepared for a landing and called for gear down. The gear lever would not go to the full down position. With the gear handle in this position the nose and left main gear came down and checked normal. The nose and left main gear were retracted and all gears indicated up. Brake and main hydraulic system pressures remained normal throughout the flight.

Several attempts were made to lower the gear without success. The emergency air system procedure for releasing the uplocks was tried following T.O. procedure. The right main gear remained up even though abrupt maneuvers under various configurations were tried.

Since all previous efforts had failed to extend the right main gear, the flight engineer, Airman Browning, and Captain Taylor started the tracing of the gear handle cables. They removed paneling and flooring from the pilots' pedestal back to where the wing joins the fuselage. Identification of the proper cable was made by checking for cable movement when the gear handle was moved. The engineer, with gloves and pliers, pulled on the gear cable after receiving a prearranged signal from Major Nase or Captain Taylor. Various configurations using the gear handle and by-pass valve and hand pressure on the cable failed to lower the right main gear.

Airman Browning and Captain Taylor hooked a tie-down belt to the cable leading to the right gear uplock. The gear handle was again placed in the down position resulting in the nose and left main gear extending. The by-pass valve was then placed in the up position and on a pre-arranged signal the engineer pulled on the tie-down belt as the pilot actuated the emergency landing gear uplatch release. The right main gear uplock released and the gear locked in the down position.

Major Nase then made a normal touchdown, cutting the engines on the runway.

During the installation of the gear down lock pins a check of the right gear uplock was made. Movement of the lock caused a small Phillips head screw to fall to the pavement. Investigation revealed that this screw prevented movement of the uplock to the release position.

The actions of this crew reflect credit upon themselves and the United States Air Force. Well Done! ☆

XB-70

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F-5A

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